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# Report

of

## J. F. Dalrymple Hay Esq^re, C.E.,

on the

## Wells Works and Properties of the Canadian Oil Wells Corporation Limited.

Petrolia, Canada,
28th September 1871.

Gentlemen,

In accordance with your instructions I have inspected the various Wells with their Engines, Tanks, and other Plant, as wellas the various Properties purchased by the Canadian Oil Wells Corporation.

I propose first to report on the existing Works, and secondly on those Lands upon which Wells have not yet been sunk.

In my inspection I have had great assistance, both from Mr. Francis, the Government Surveyor of the District, and also from his able Report, submitted to you on the 6th of March of this year, which I find to be correct in every particular.

I will therefore commence with

### "Reliable" Well, N^o. 1.

This Well with its Distillery and Refinery is situatedclose to the Siding of the Petrolia Branch of the Great Western Railway of Canada.

The Well, which is 498 feet in depth is pumped by an Engine of 20 Horse power, which I find to be in excellent condition. The Boiler from which Steam is supplied to this Engine also works two other Engines, one of which is employed in boring a new Well called "Reliable" N^o. 2 at a distance of about 50 yards from

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"Reliable" N°1" The boring has now reached a depth of 130 feet, the average depth gone through in a day of 24 hours being 32 feet.

The other Engine supplied with Steam from this Boiler is one of 12 horse power, which is used for supplying the blast of air necessary for agitating the distilled Oil when it is being heated with Sulphur and litharge in the Refinery. This Engine is also in excellent order, and is nearly new; the still, tanks and pipes I find to be in good condition.

The refuse from the Still, which amounts to 15% of the Oil passed into it, is here used as fuel, and a most effective fire is produced, by passing a jet of Gas and Steam over this tar residuum. The same fuel is used for heating the Still, this effects a great saving by obviating the necessity of burning wood.

Two new Buildings, in one of which is the Refinery, are nearly completed, they appear to me to be well built and admirably suited for the storage of Casks of refined Oil, as they are close to the Railway Siding. The Shipping tank is capacious, a new description of Iron tank, holding 75 barrels of Oil, is coming into use for its transport from Petrolia. These tanks are of the pattern, which the Oil Companies of Pennsylvania are compelled to use by the Government of the United States. They are new, strongly made, and well adapted for the safe carriage of Oil. As yet, in Canada, their use is optional.

The following Wells "Gem", "Moonlight", "Eclipse", "Parsons N°1." and "Parsons N°2", are all connected by Pipes with the "Reliable" Still and Refinery as well as with their own Shipping Tanks. These Pipes seem to be in good order. The water supply at the "Reliable" Well is good and sufficient.

## The "Gem", "Moonlight" and "Eclipse" Wells.

These Wells are situate on the banks of "Bear Creek", about half a mile distant from the Petrolia Branch Railway, and from the "Reliable" Well with the Refinery and Still of which they are connected. The "Gem" Well has a very fine Engine of 50 horse power, and the Eclipse, one of 20 horse power. Both of these are supplied by Steam from the same boiler. The "Eclipse" Engine also works a pump, for forcing the Oil up a 40 feet rise to the level of the Shipping Tank on the Railway. The "Moonlight" Well has a separate Boiler working a Steam Engine of 23 horse power. I am quite satisfied with the condition in which I find these Engines.

The pipes, tanks, and pumps are in fair order and the connection with the Railway is very good. There is now erecting (since Mr. Francis' report) a fine tubular boiler, which from its central position will be well able to work all three Steam Engines, as well as a fourth, should another Well be sunk on the property.

Wood is here used for fuel, but in the event of the supply of wood failing, there should be no difficulty in obtaining the tar residuum fuel from the "Reliable" Distillery.

I would recommend that small additional Storage reservoirs for Water should be made at these Wells, as the supply this Summer has run rather short. Also that some of the pipes conveying the Oil from the various tanks, should be more carefully covered in, especially the long line of pipe from these Wells to their own Shipping Tank on the Railway.

## The "Parsons" Wells Nos 1 and 2.

These Wells are situated about half a mile, North of the "Reliable" Well, with which they are connected for purposes of refining and distillation.

"Parsons" Well No. 1" is worked by an Engine of 20 Horse power, and "Parsons" No. "2", by an Engine of 18 Horse Power. They have separate Boilers. There is here a very large under-ground tank, calculated to hold 130,000 gallons of Oil. This tank is, at present, almost full. These Wells have their own Shipping tank on the Railway which is about half a mile distant.

The plant and Engines seem to me to be in excellent repair. At present the water from these Wells is run to waste. I would suggest that it should be collected and stored in small reservoirs in case of the present supply falling short. Wood fuel is consumed here, but a jet of gas is forced over the fire which greatly increasing the heat diminishes the consumption of wood.

## The "Park Farm", "Richard Cobden" and "W. K. Muir" Wells.

These Wells are situated about a mile and a quarter west of the "Pithole" Siding of the Petrolia Branch of the Great Western Railway, with which they are connected by 2000 yards of excellent 3 inch piping. The Engine of the "Park Farm" Well also pumps the Oil to the Station; 1300 Gallons per hour can be pumped to the Shipping tank through the pipe without extra expense. It is an Engine of 20 Horse power.

The "Richard Cobden" Well is pumped by an Engine of 20 Horse power and the "W. K. Muir" by an oscillating engine of 12 horse power.

The Engines of these three wells are supplied

with steam power from one boiler, and Mr Francis in his report is of opinion that the arrangement of these wells are "perhaps the most complete of any in Canada". The fuel used here is wood of which there is a plentiful supply and the Gas from the well is forced over the fire as at the "Parsons" wells. The Water supply here is good. These wells are not connected with the "Reliable" Refinery and Still. The great distance to the Railway and the expense of Carting the barrels of refined oil, rather make me doubt the expediency of at present erecting a Distillery here. The tanks and machinery as well as the pipes here are in first rate working order. Before closing my report on the existing Works I think I may mention that the average depth at which the stratum of Carboniferous Limestone (locally termed "Oil Rock") holding the Oil is found is in the Petrolia district from 460 feet to 500 feet. The cost of boring is Two dollars ($2.00) or 8/4d per foot on the average.

Note- In the Oil Springs district the depth at which Oil is obtained is from 360 to 400 feet being about 100 feet less in depth than in the Petrolia district.

Mr Francis calculates that the average cost of getting a Well into what I may call oil producing condition to be Three thousand dollars ($3000.00) or about £625.0.0 Sterling. This includes the Engine, all the necessary plant and the cost of boring the well. The Steam Engine which is eventually to pump the well being used for the purposes of boring.

From experience it has been found that Wells may be sunk so close together that two Wells within 20 yards of one another prove so completely different in yielding

power that the 2nd one has been abandoned as a non-paying Well while the first Well has yielded a very large amount of Oil

The various tools for boring as well as the ingenious instruments for recovering broken tools, are in excellent condition

The Shipping Tanks of which there are 4, are in good order, and I may give the same report of the rails and points on the Petrolia and Pt hole sidings at the Shipping Stations on the Petrolia Branch of the Great Western Railway.

Having now endeavoured to describe the Condition in which I find the Engines and plant on the properties of the Corporation at present producing Oil - I will now report on the various Estates in the Townships of Enniskillen, Plympton and Dawn. In doing this I shall state the distance from the nearest point of each allotment to the nearest Railway, the nearest Well sunk, and the estimated proportion of forest to cleared land. The timber appears to me to be very fine, and to be well suited both for building derricks, houses Vc Vc and also for the purposes of fuel - I again refer you to Mr Francis' Report for his calculations of the probable average yield of the Wells to be sunk on the various Estates in these Townships - In order to simplify this as much as possible I will report very shortly on each allotment in the order in which they come in Mr Francis' Report

## Township of Enniskillen

1. S.W. ¼ of Lot 11 in the 11th Concession of this Township - is unsettled - is 50 acres in extent, of which about 20 acres are cleared - The

remaining 30 acres are thickly covered with fine timber. – This Estate is 3/4 of a mile from Petrolia Station and is not far from the Corporation's Wells "Parsons" Nos "1 and 2." – There is one Well sunk on the adjoining quarter of this Lot

2. E 1/2 of Lot 11 in 13th Concession of Enniskillen is settled, is 100 acres in extent, of which about 45 acres are cleared and the remainder is well covered with wood. This Estate is situated about 1/4 of a mile West of the Petrolia Branch Railway and 3/4 of a mile from the "Park Farm" – "Cobden" and "Muir" Wells of the Corporation. –

3. E. 1/2 Lot 4 in 3th Concession, Enniskillen – Is unsettled – is 100 acres in extent – No land has been cleared; is well timbered; is a considerable distance from a Railway, being about 2 and 3/4 miles from the Great Western Railway of Canada (London and Sarnia Section) and 3 and 1/4 miles West of the Petrolia Branch Railway.

4. W 1/2 of W 1/2 of Lot 15 in 13th Concession of Enniskillen, is unsettled, 50 acres in extent. No land has been cleared, and it is thickly covered with timber; is situated one mile East of the Petrolia Branch Railway There are Wells at present believed to be producing plentifully at a distance of 1/2 a mile to the South. –

5. Part of Sublot Number 11 on the S.E. 1/4 of Lot No 11 in the 12th Concession of Enniskillen is unsettled and contains 3 and 1/2 acres and appears to be surrounded by large Wells in every direction, is within a quarter of a mile of the Corporations "Park Farm" – "Cobden" and "Muir" Wells and is distant about a mile from the Petrolia Branch Railway. –

## Township of Plympton.

1. W 1/2 of 9 in 1st Concession of Plympton - Is settled, 50 Acres are cleared, and 50 Acres are well wooded - On this Estate there is a dwellinghouse and farm buildings which appear to me to be in excellent repair - There is also an Orchard of about one acre in extent - This Estate is situated half a mile from the main line of the Great Western Railway of Canada (London and Sarnia Section) - The nearest well at present working is distant one mile and a quarter from this Estate - Upon this property there is a good spring of pure water -

## Township of Enniskillen (cont'd)

6 Lot N° 23 in the 4th Con. Enniskillen is 200 acres in extent unsettled and completely covered with fine timber - Is situated at a distance of about One mile from Oil Springs Wells a few of which are at present being worked a Railway called "The Great Southern Railway of Canada" is at present in course of construction; this Railway passes within a quarter of a mile of the property, a branch line from this Railway is to be constructed to Oil Springs - These lines will probably be finished within two years from this date.

7 Lot N° 25 in 3rd Con. Enniskillen is unsettled 200 acres in extent and well wooded - It is situated one mile and a half from the proposed Main Line of the Great Southern Railway of Canada, and about one mile east of the Town and wells of Oil Springs -

8 E. 1/2 of lot 30 in 1st Con. Enniskillen is unsettled - 100 acres in extent - and is covered with

fine timber - Is at present almost inaccessible as there is no Roadway within a mile of the Property, it is situated 2 miles and a half from the town, wells and proposed terminus of Oil Springs and about the same distance from the Main Line of the proposed Great Southern Railway of Canada -

## Township of Dawn.

1 E. 1/2 Lot 33 in 12 Con. Dawn is 100 acres in extent - It adjoins N° 8 in Enniskillen (last mentioned) is covered with wood, but there is a road to it - This allotment is two miles distant from the terminus of the Oil Springs Branch of the proposed Railway and from the Town and wells -

2 E. 1/2 of Lot 32 in 6th Con. Dawn - This Estate is 100 acres in extent and is thickly covered with fine timber - It is distant about 2 miles and a half from the town of Oil Springs and from the proposed terminus of the branch Railway there -

I have now reported briefly upon each of the lots separately and would recommend on the advice of those who practically understand the subject that the Lots situated in the Oil Springs district should not at present be worked -

These are what I have numbered Enniskillen numbers 6.7.8, and Dawn numbers 1 and 2 -

My reasons for this are;

(1) The absence of Railway Communication and the great expense of carting.

(2) The great Acreage of Land near Petrolia which will prove productive viz: the lots which I have numbered as Enniskillen N°s 1.2.3.4 and 5 and Plympton N° 1

Oil Springs is six miles from Petrolia Station on that branch of the Great Western Railway, and is also eighteen miles from Sarnia -

Owing partly to the alarm of a Fenian Invasion, in 1866; partly to the low price of Oil at that time and partly to the great expense of carrying the Oil by cartage, most of the wells in the Oil Springs district are not at present working but before that (1866) the wells appear to have been most productive (see Mr Francis' Report.)

I will now give a small Table of the rate of wages received by the foremen, engineers, drillers, and scaffold men, employed on the various works.

While a well is being drilled, the staff consists of what I may term two watches, relieving one another at 12 o'clock Noon & 12 o'clock Midnight. The foreman is always there during the day and, is ready to be called at any hour during the night, one driller, one Scaffoldman, and one Engineer are there during each watch.

The Foreman receives – 2 dollars — 8/3½ per diem
The Driller " 1 dollar & seventy five cents — 7/11½ per d.
The Scaffoldman " 1 dollar & fifty cents — 6/3 p. d.
The Engineer " 1 dollar & seventy five cents — 7/11½ p. d

After the well is working the Staff also consists of two watches relieving one another at 12 mid day, and 12 at midnight. A foreman, who is always present during the day, and one Engineer to attend to the Boiler and Well.

The foreman receives 2 dollars or 8/3½ per day. The Engineer One dollar and seventy five cents or 7/11½ per day, excepting in the matter of pay the day in this district is always 24 hours as the wells are pumped night and day, when more than one Engine is worked by one boiler, no extra hands are required. The average price of piping required to carry Oil to the Railway (with taps, union joints, delivered on the ground & laid) is 1/6 per foot.

In conclusion I would express the great satisfaction, with which I have observed the thorough and complete system on which the wells are worked.

I have the honor to be, Gentlemen,
Your obedient Sewant,
J. F. Dalrymple Hay C.E.

# Appendix

I append to my report, a statement of the latest Return of the Average daily shipment of Crude Oil. During my visit to Petrolia, the average daily returns of shipment of Crude Oil, shew a greater yield than in the previous week.

For comparison I give a Table shewing the average number of barrels from each well

| Wells | Sep.r 25th to Sep.r 29th | Sep.r 19th to Sep.r 24th |
|---|---|---|
| 1. "Reliable" | 80 | 69 |
| 2. "Gem" "Moonlight" & "Eclipse" | 340 | 290 |
| 3. "Parsons" No.s 1 and 2 | 120 | 170 |
| 4. "Mair" "Park Farm" & "Cobden" | 303 | 280 |
| Total | 843 barrels | 809 barrels |

Shewing an increase of 34 barrels.

This I think is evidence sufficient to shew that the supply is not falling off, and that there is every prospect of the wells continuing to produce Oil in paying quantities.

A change in the specific gravity of the Oil, and a gradually diminishing flow have been ascertained to indicate that a well is about to cease. These signs however commence some months before the yield ceases. The Reservoirs and Tanks, all of which I have inspected are at present very full, so that there is a large supply of Crude Oil in store.

I have ascertained by enquiry that it would not pay at present to farm the lands, but, in the event of the supply of Oil ever failing on any of the Estates, I feel confident that land which grows such fine timber, would in all probability, prove good for farming purposes.

J. T. Dalrymple Hay C.E.